Discussion of Policy Options for Water Level Fluctuations in Impoundments

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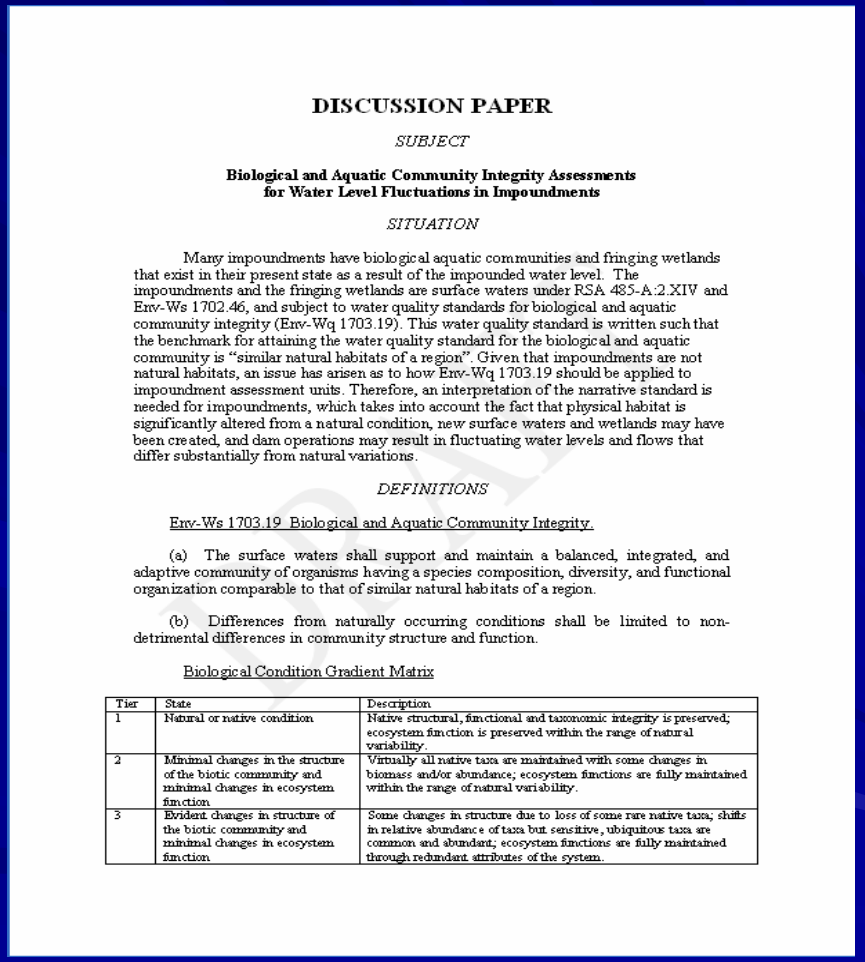
A presentation to the WQSAC
January 27, 2010

Recap

- DES needs a policy for interpreting Env-Wq 1703.19 for water level fluctuations.
- Discussion paper presented last meeting.
- Approach was to use Biological Condition Gradient (BCG) to quantify degradation.



DISCUSSION PAPER

SUBJECT

Biological and Aquatic Community Integrity Assessments for Water Level Fluctuations in Impoundments

SITUATION

Many impoundments have biological aquatic communities and fringing wetlands that exist in their present state as a result of the impounded water level. The impoundments and the fringing wetlands are surface waters under RSA 485-A:2.XIV and Env-Ws 1702.46, and subject to water quality standards for biological and aquatic community integrity (Env-Wq 1703.19). This water quality standard is written such that the benchmark for attaining the water quality standard for the biological and aquatic community is "similar natural habitats of a region". Given that impoundments are not natural habitats, an issue has arisen as to how Env-Wq 1703.19 should be applied to impoundment assessment units. Therefore, an interpretation of the narrative standard is needed for impoundments, which takes into account the fact that physical habitat is significantly altered from a natural condition, new surface waters and wetlands may have been created, and dam operations may result in fluctuating water levels and flows that differ substantially from natural variations.

DEFINITIONS

Env-Ws 1703.19 Biological and Aquatic Community Integrity.

(a) The surface waters shall support and maintain a balanced, integrated, and adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of similar natural habitats of a region.

(b) Differences from naturally occurring conditions shall be limited to non-detrimental differences in community structure and function.

Biological Condition Gradient Matrix

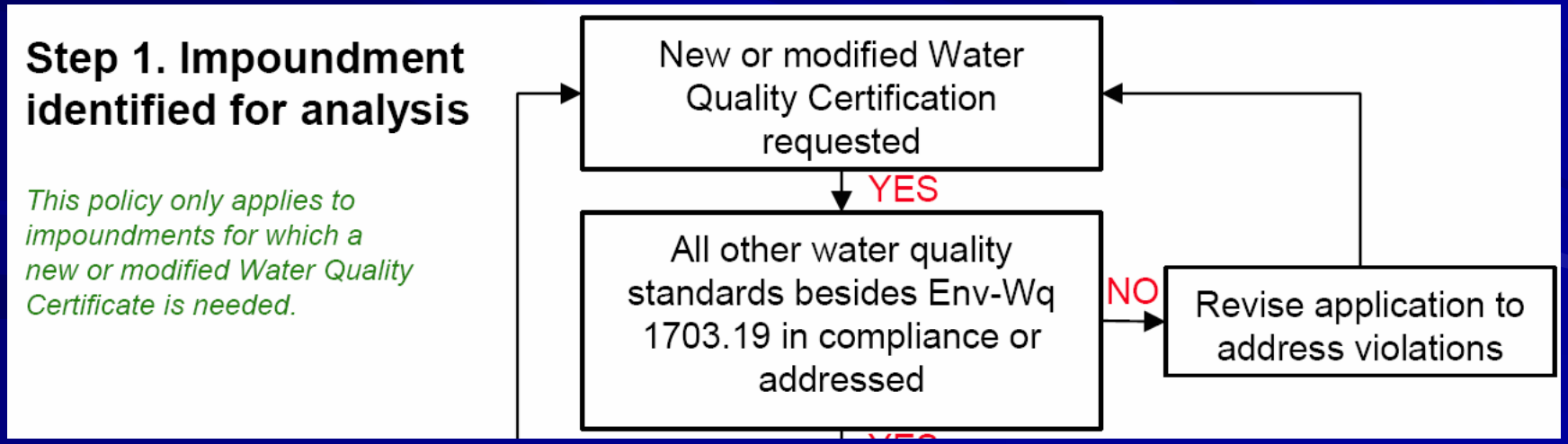
Tier	State	Description
1	Natural or native condition	Native structural, functional and taxonomic integrity is preserved; ecosystem function is preserved within the range of natural variability.
2	Minimal changes in the structure of the biotic community and minimal changes in ecosystem function	Virtually all native taxa are maintained with some changes in biomass and/or abundance; ecosystem functions are fully maintained within the range of natural variability.
3	Evident changes in structure of the biotic community and minimal changes in ecosystem function	Some changes in structure due to loss of some rare native taxa; shifts in relative abundance of taxa but sensitive, ubiquitous taxa are common and abundant; ecosystem functions are fully maintained through redundant attributes of the system.

Comments on Discussion Paper

- Applicability
  - How many impoundments affected?
  - How will impoundments be identified?
- Simplified approach needed
  - Need an easy screening method for *de minimus* cases
- Need to link to existing water quality standards
- Complicating factors for BCG approach
  - Seasonality
  - Need to define target taxa
  - What is reference condition? Impoundment or stream?
  - Does BCG consider only water level or other stressors?
  - Are mercury releases considered?
  - Would fish passage barriers be considered a violation?

Applicability

- Limited (for now) to impoundments needing a new or modified Water Quality Certification
- All other WQS must be met before starting

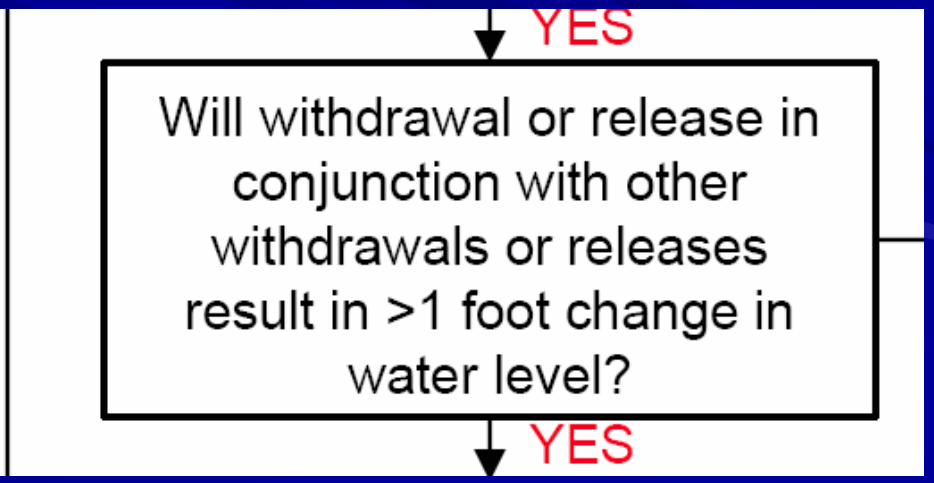


Screening Method – Step 1

- Selected 1 foot as a de minimus threshold.
- Maine DEP uses this value for summer, but allows 2 foot draw downs in winter.
- For DES dams, 9% have 1 ft drawdown and 42% have 1-2 ft drawdown.

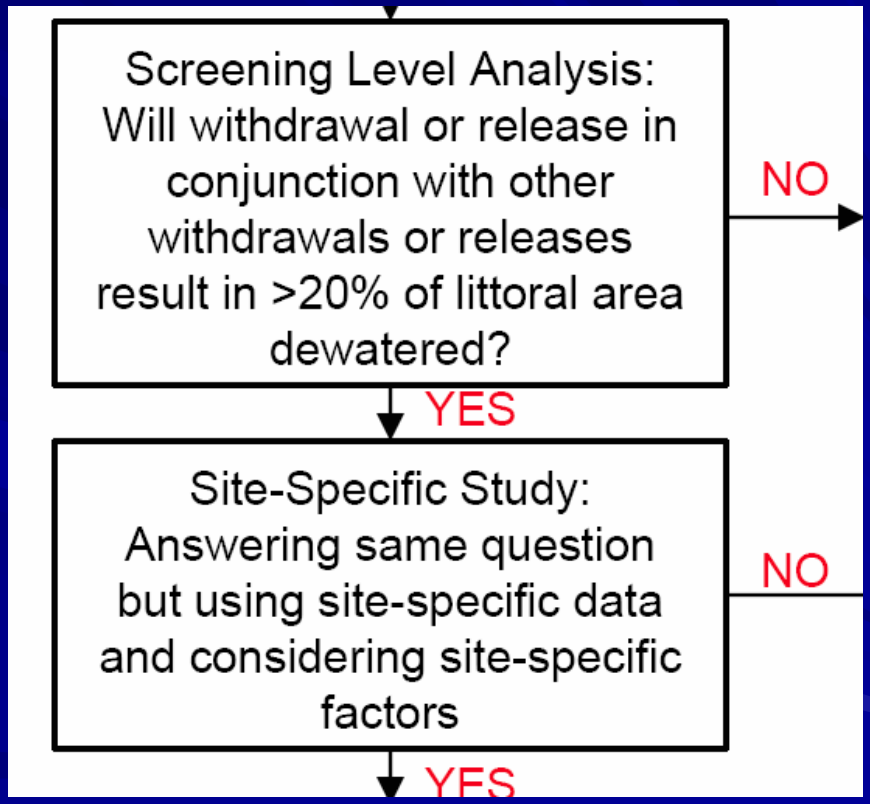
Step 2. *De minimus* Threshold

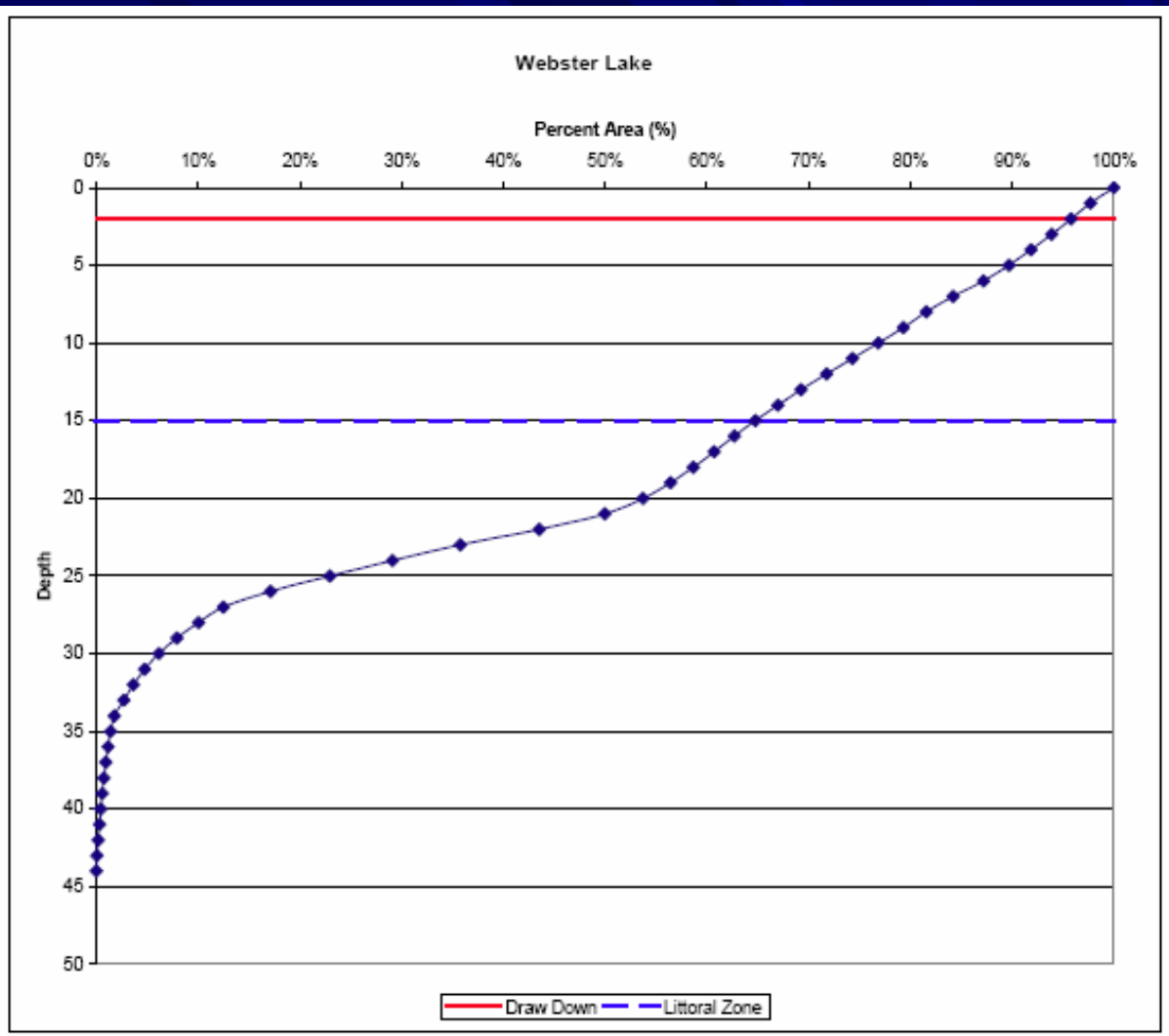
De minimus threshold of 1 foot follows Maine DEP regulations (Chapter 587) for summer season.



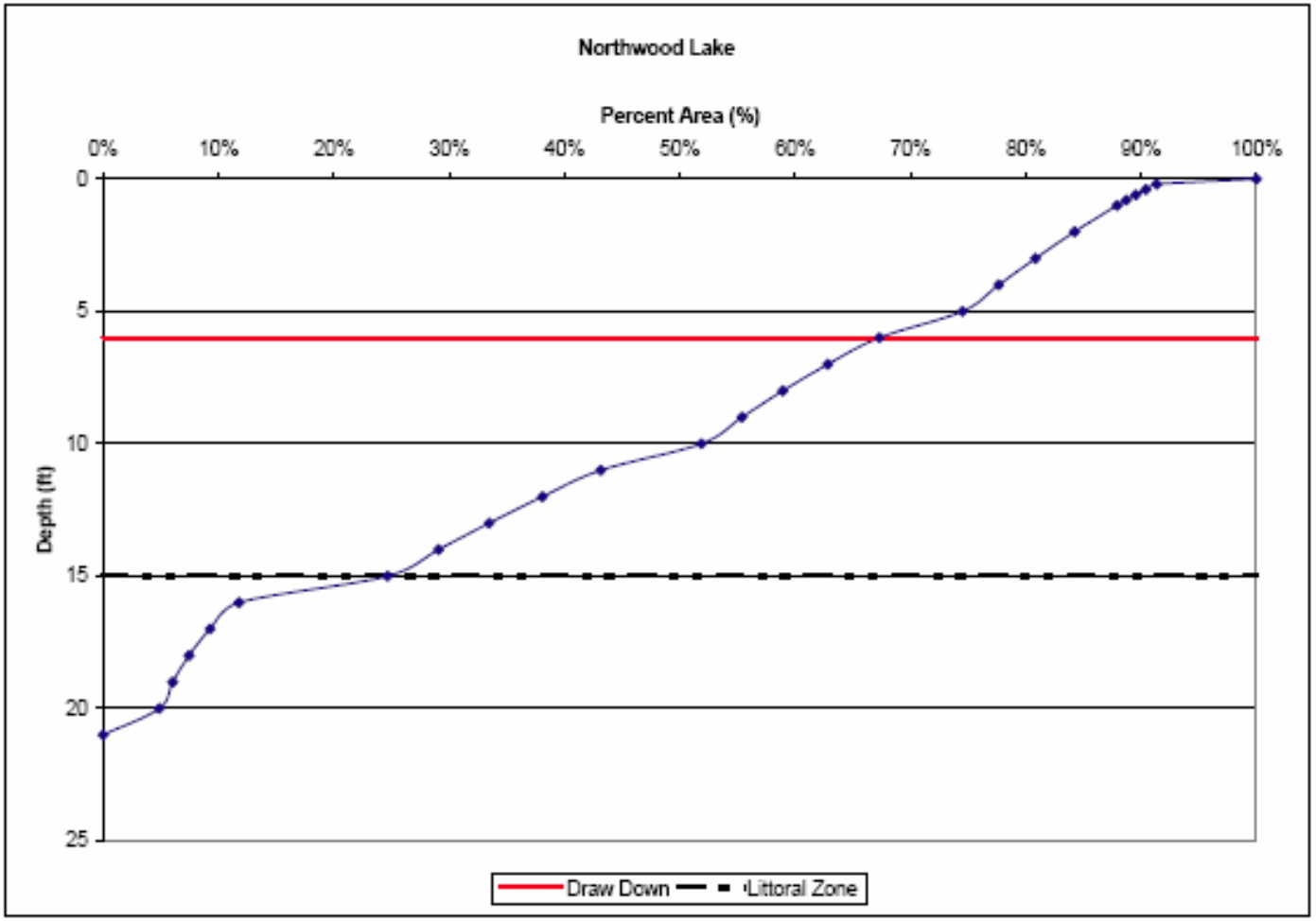
Screening Method – Step 2

- Consider littoral zone (0-15 ft depth) to be critical habitat
- Allowing up to 20% of the habitat to be dewatered by all withdrawals or releases
- 20% threshold follows antidegradation rules
- Maine DEP policy allows 25% of littoral zone dewatered
- Site-specific studies possible





Lake Surface Area:	606 acres
Littoral Zone Area:	213 acres
20% of Littoral Zone Area:	43 acres
Depth at 20% of Littoral Zone Area:	3.5 feet
Draw Down Depth:	2 feet

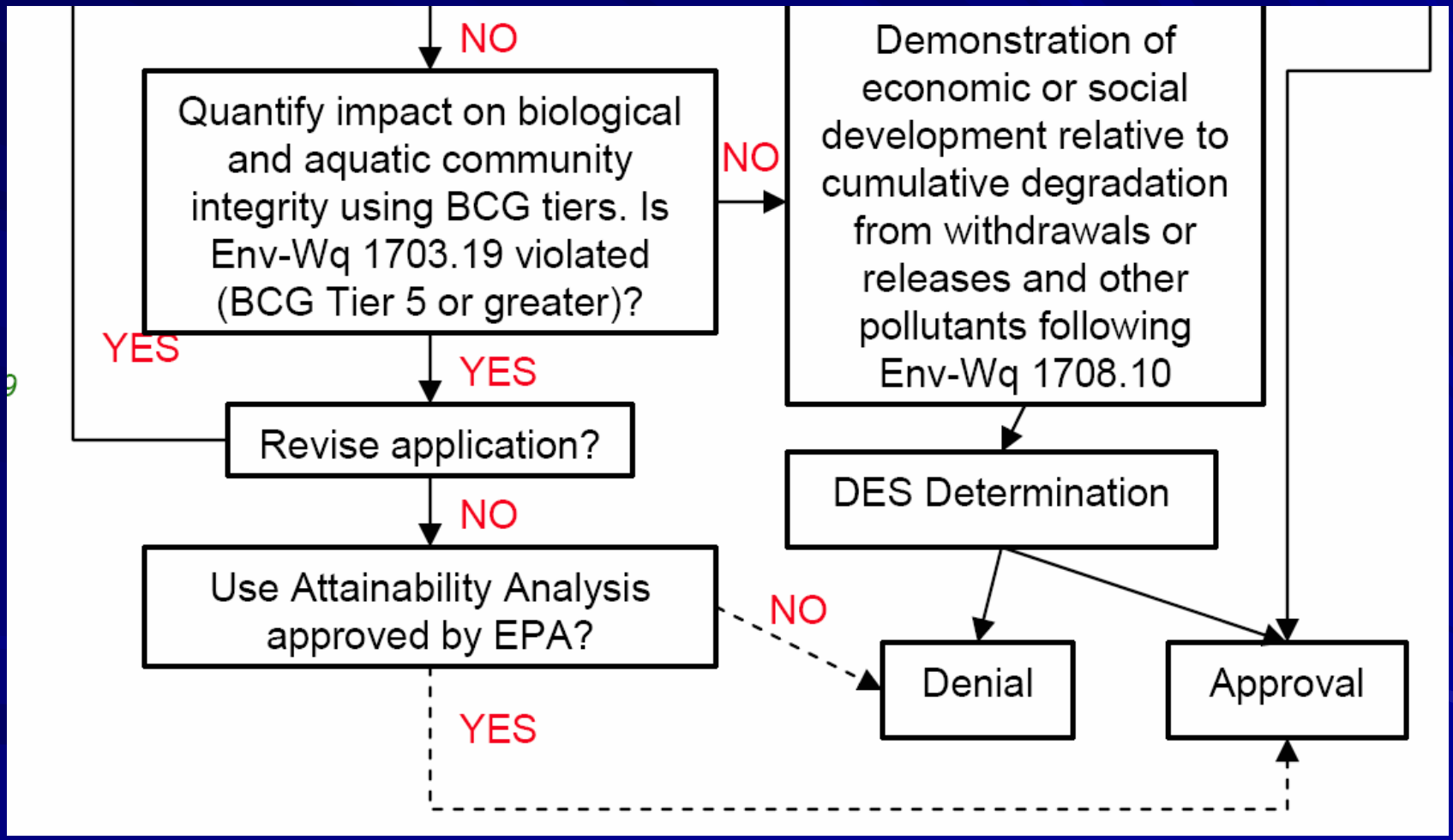


Lake Area:	651 acres
Littoral Zone Area:	490 acres
20% of Littoral Zone Area:	98 acres
Depth at 20% of Littoral Zone Area:	2 feet
Actual Draw Down Depth	6 feet

Linkage to Water Quality Standards

- Outcome of screening method is a “significant” or “insignificant” determination relative to Env-Wq 1708.09
- If “insignificant”, withdrawal or release will be approved contingent on other WQS being met and other agencies’ approval.
- If “significant”, begin the antidegradation analysis.

Antidegradation Analysis



Next Steps

- Incorporate comments on the flow chart
- Prepare narrative explanation
- Research questions regarding the BCG tiers